

24P409S

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Name:

Reg.No:

FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2026

(CBCSS - PG)

CC19PCHE4E08 - ORGANOMETALLIC CHEMISTRY

(Chemistry)

(2019 Admission - Supplementary/Improvement)

Time : 3 Hours

Maximum : 30 Weightage

Section A

Answer any *eight* questions. Each question carries 1 weightage.

1. Differentiate homoleptic and heteroleptic organometallic compounds with specific examples.
2. Explain using MO energy diagram with example why certain transition metals prefer square planar geometry with 16 electron count.
3. What is Heiber base reaction?
4. Give any two examples for photochemical substitution.
5. Discuss any two synthesis of multiple bonds to hetero atoms in organometallic compounds.
6. Explain fluxional behavior of organometallic compounds.
7. What is hydrogenation reaction? Suggest a homogeneous catalyst for the reaction.
8. A 16e metal complex LnM is found to react with ethylene to give 1-butene and LnM . Provide a reasonable mechanism involving oxidative coupling.
9. Explain beta hydride elimination with suitable example.
10. Write a note on Fischer Tropsch method.
11. What is Zeigler Natta catalyst?
12. Explain oxidative addition reaction with suitable example.

(8 × 1 = 8 Weightage)

Section B

Answer any *four* questions. Each question carries 3 weightage.

13. Discuss the nature of orbitals involved in Fischer type carbene complex $\text{W(CO)}_5\{\text{C(OMe)Ph}\}$
14. Write a note on Collman's reagent.
15. Write a note on dihydrogen complexes.

16. Write a note on catalytic steps in a homogeneous reaction.
17. Explain the hydroformylation.
18. Explain various reaction mechanisms of oxidative additions.
19. Explain the Chalk-Harrod mechanism of hydrosilation reaction.

(4 × 3 = 12 Weightage)

Section C

Answer any *two* questions. Each question carries 5 weightage.

20. Discuss Fischer Tropsch reaction and watergas shift reaction.
21. Discuss the synthesis, structure, and bonding in cyclopentadienyl complexes taking ferrocene as an example.
22. Discuss various dissociation pathways of organometallic compounds.
23. Discuss the various steps involved in homogeneous catalysis using organometallic complexes.

(2 × 5 = 10 Weightage)
